Table A-1A. Sources of Data for Linkage Analysis and Assumptions Used in Mass Balance Model for Typical Conditions, Part 1: Northern Reaches

Reach	Inflows and Outflows to Reach: Best Available Data				Assumption for Model		
Type of Inflow or Outflow	Flow, ft3/s*	Data Source for Flow	Conc., mg/L	Data Source for Concentration	Flow, ft3/s*	Conc., mg/L	Rationale for Assumption
Tapo Canyon, Reach 8							
Groundwater discharge and urban non-storm runoff	19 (sum, Rchs 7+8)	Total flow estimated for Reaches 7 and 8, average of measurements 1973-1983: Boyle Engineering (1987).	152	Average concentration for 1973-83 of in-stream flow in Reaches 7+8, including pumped groundwater: Boyle Engineering 1987			Average flow reported by Boyle Engineering is not representative of typical conditions, so total flow is assumed to be less. Partition between runoff and groundwater discharge is assumed.
Groundwater discharge	4.3 (sum, Rchs 7+8)	Average of reported flow under low-flow (summer) conditions, 1993-94: Montgomery Watson, 1995; 4.3 cfs is total for Reach 8 and Reach 7 both above and below USGS gauge			0.5	160	Assumed apportionment among Reach 8, Reach 7 above gauge, and Reach 7 below gauge. Also incorporates reported groundwater pumping in western Simi Valley. Assumed 0.5 ft3/sec in low flow conditions, 0.75 ft3/sec in maximum non-storm flow. Assumes groundwater is somewhat greater in concentration than the reported 152 mg/L in-stream, and assumes non-storm runoff is somewhat less.
Urban non-storm runoff			130	Discharge from urban and suburban land uses observed (runoff from domestic irrigation, etc). RWQCB monitoring of sporadic discharges shows average chloride concentration to be greater than similar urban non-storm flow elsewhere in the watershed.	0.5	130	Flow assumptions based on RWQCB monitoring and analogy to urban non-storm discharges in Reaches 9 and 11 (Boyle Engineering 1987). Assumed 0.5 ft3/sec in low flow conditions, 0.75 ft3/sec in maximum non-storm flow.
Arroyo Simi, Reach 7--above USGS gauge							
Groundwater discharge and urban non-storm runoff	19 (sum, Rchs 7+8)	Total flow estimated for Reaches 7 and 8, average of measurements 1973-1983: Boyle Engineering 1987	152	Boyle Engineering 1987: as above			Average flow reported by Boyle Engineering is not representative of typical conditions, so total flow is assumed to be less. Partition between runoff and groundwater discharge is assumed.
Groundwater discharge	4.3 (sum, Rchs	4.3 cfs is total for Reach 8 and Reach 7 both above and below USGS gauge:			0.5	160	Assumed apportionment between Reach 8 and Reach 7 is consistent with flow defined as typical low-flow conditions at the USGS

Table A-1A. Sources of Data for Linkage Analysis and Assumptions Used in Mass Balance Model for Typical Conditions, Part 1: Northern Reaches

Reach	Inflows and Outflows to Reach: Best Available Data				Assumption for Model		
Type of Inflow or Outflow	Flow, ft3/s*	Data Source for Flow	Conc., mg/L	Data Source for Concentration	Flow, ft3/s*	Conc., mg/L	Rationale for Assumption
	7+8)	Montgomery Watson 1995:					gauge, Madera Road..Also incorporates reported groundwater pumping in western Simi Valley. Assumed 0.5 ft3/sec in low flow conditions, 0.75 ft3/sec in maximum non-storm flow. Assumes groundwater is somewhat greater in concentration than the reported 152 mg/L in-stream, and assumes non-storm runoff is somewhat less.
Urban non-storm runoff	0.5	Based on analogy to urban non-storm discharges in Reaches 9 and 11 (Boyle Engineering 1987)	100	Based on analogy to urban non-storm discharges in Reaches 9 and 11 (Boyle Engineering 1987).	0.5	100	Assumed 0.5 ft3/sec in low flow conditions, 0.75 ft3/sec in maximum non-storm flow.
Pumped groundwater	3.0	Montgomery Watson, 1995	150	Montgomery Watson, 1995	1.5	150	Dewatering for construction and to avoid routine discharges in urban areas in area of shallow groundwater. Assumed to be zero in low flow conditions (assumes water table falls, so pumping is not necessary); assumed 2.0 ft3/sec during maximum non-storm flow. Concentration estimated conservatively using Montgomery-Watson results.
			133	CCCS, 2000			
Control point: USGS gauge, Arroyo Simi Madera Road	3.5	USGS data: Staff analysis identified 3.5 ft3/sec as typical low flow during non-storm conditions, 1979-1983.			3.5	(s)	Selected flow defines typical conditions.
	45	CCCS, 2000	150				CCCS average of 12 flow measurements does not represent typical low-flow conditions. CCCS concentration average of 11 samples, omitting April 1999 sample (anomalously low), collected during storm runoff; average represents all upstream sources, including pumped groundwater, so apportionment is assumed between urban non-storm runoff and groundwater discharge, as described above.
Arroyo Simi, Reach 7--below USGS gauge							
Groundwater discharge	19	Total flow estimated for	152	Average concentration			Average flow reported by Boyle

Table A-1A. Sources of Data for Linkage Analysis and Assumptions Used in Mass Balance Model for Typical Conditions, Part 1: Northern Reaches

Reach	Inflows and Outflows to Reach: Best Available Data				Assumption for Model		
Type of Inflow or Outflow	Flow, ft3/s*	Data Source for Flow	Conc., mg/L	Data Source for Concentration	Flow, ft3/s*	Conc., mg/L	Rationale for Assumption
and urban non-storm runoff	(sum, Rchs 7+8)	Reaches 7 and 8, average of measurements 1973-1983: Boyle Engineering 1987		for 1973-83 of in-stream flow in Reaches 7+8, including pumped groundwater: Boyle Engineering 1987			Engineering. is not representative of typical conditions, so total flow is assumed to be less. Partition between runoff and groundwater discharge is assumed.
Groundwater discharge	4.3 (sum, Rchs 7+8)	Average of reported flow under low-flow (summer) conditions, 1993-94: Montgomery Watson, 1995; 4.3 cfs is total for Reach 8 and Reach 7 both above and below USGS gauge			1.0	150	Assumed apportionment between Reach 8 and Reach 7 is consistent with flow defined as typical low-flow conditions at the USGS gauge, Madera Road .
Simi Valley Water Quality Control Plant (POTW)	14.1	Average of 1999 NPDES reported discharges	113	Average of 1999 NPDES reported discharges	14.1	113	
Arroyo Las Posas, Reach 6							
Ventura County (Moorpark) Wastewater Treatment Plant (POTW)	3.1	Average of 1998 NPDES reported discharges	118	Average of 1998 NPDES reported discharges	0	118	Effluent discharges to percolation ponds in an area of groundwater recharge.
Inflow from Reach 7					18.6	(s)	Calculated by the model using assumptions described in this table.
Agricultural withdrawals					-6	(s)	Total of groundwater recharge plus agricultural withdrawals adjusted to meet known condition of in-stream flow = 0 near Somis Road.
Groundwater recharge	-14		118		-12.6	(s)	Total of groundwater recharge plus agricultural withdrawals adjusted to meet known condition of in-stream flow = 0 near Somis Road.

Table A-1B. Sources of Data for Linkage Analysis and Assumptions Used in Mass Balance Model for Typical Conditions, Part 2: Southern Reaches

Reach: Type of Inflow or Outflow	Inflows and Outflows to Reach: Best Available Data — Flow, ft3/s*	Data Source for Flow	Conc., mg/L	Data Source for Concentration	Assumption for Model — Flow, ft3/s*	Assumption for Model — Conc., mg/L	Rationale for Assumption
North Fork Conejo Creek, Reach 12							
Hill Canyon POTW discharge, groundwater discharge, and urban non-storm runoff	15 (part)	Total for Reaches 12+13, average flow 1973-1983 = 15 cfs: Boyle Eng. 1987	140	Average of 12 samples 1998-99: CCCS 2000	2.5	150	No available data to partition sources among groundwater, urban non-storm runoff, and any other sources. Assumed total flow in Reaches 12+13 = 5 ft3/sec to be consistent with USGS data for typical conditions of 16 ft3/sec at control point in Reach 9B. Partition between Reaches 12 and 13, and partition between groundwater discharge and urban non-storm runoff, based on best professional judgment using analogy with urban non-storm runoff for Reaches 9 and 11 from Boyle Engineering (1987).
Hill Canyon POTW discharge, groundwater discharge, and urban non-storm runoff	16 (part)	Total for Reaches 12+13 + Hill Canyon WWTF, average flow for 12 samples 1998-99 = 31 cfs: CCCS 2000					CCCS average of 12 flow measurements does not represent typical low-flow conditions.
South Fork Conejo Creek, Reach 13							
Hill Canyon POTW discharge, groundwater discharge, and urban non-storm runoff			165	Average of 12 samples 1998-99: CCCS 2000	2.5	160	CCCS average of 12 flow measurements does not represent typical low-flow conditions.
Conejo Creek Hill Canyon, Reach 10							
Groundwater recharge	-2	Estimate for 1973-1983: Boyle Eng. 1987 (for Santa Rosa Valley segment)			-5	(s)	Assumed recharge in Hill Canyon reach, including downstream end of North Fork, to be consistent with typical low-flow conditions at USGS gauge Conejo Creek above US Route 101.
Hill Canyon Wastewater Treatment Facility (POTW)	15.2	Average of 1999 NPDES reported discharges	118	Average of 1999 NPDES reported discharges	15.2	118	
Agricultural withdrawals	-0.2	Average for 1973-1983: Boyle Engineering 1987			0	(s)	Assumed to be 0 ft3/sec during typical low-flow conditions, 0.4 ft3/sec during

Table A-1B. Sources of Data for Linkage Analysis and Assumptions Used in Mass Balance Model for Typical Conditions, Part 2: Southern Reaches

Reach	Inflows and Outflows to Reach: Best Available Data				Assumption for Model		
Type of Inflow or Outflow	Flow, ft3/s*	Data Source for Flow	Conc., mg/L	Data Source for Concentration	Flow, ft3/s*	Conc., mg/L	Rationale for Assumption
							maximum non-storm flow
Arroyo Santa Rosa, Reach 11							
Urban non-storm runoff plus groundwater discharge							RWQCB staff observations: flow visible under non-storm conditions is low, slow, promotes algal growth; no information available to definitively distinguish between urban runoff and groundwater discharge. Distinction made using best professional judgment to be consistent with information about other reaches and downstream conditions.
Urban non-storm runoff	2.7 (sum, Rchs 11 and 9B)	Total runoff for Santa Rosa Valley (Reach 11 and 9B), estimated average for 1973-1983: Boyle Engineering 1987			1.0	100	Distinction between Reaches 9B and 11 made using best professional judgment to be consistent with information about other reaches and downstream conditions.
Groundwater discharge					0.8	130	
Olsen Road (POTW)	0.31	Average of 1999 NPDES reported discharges	106	Average of 1999 NPDES reported discharges	0	n.a.	This POTW is scheduled for decommissioning, so is not included in the linkage model for future conditions.
Agricultural withdrawals	-4.2 (sum, Rchs 11 and 9B)	Total irrigation withdrawals for Santa Rosa Valley (Reaches 11 and 9B), estimated average 1973-1983: Boyle Engineering, 1987			–0.6	(s)	No agricultural withdrawals permitted in Reach 11, but withdrawals are observed.
Groundwater recharge	-1.8 (sum, Rchs 11 and 9B)	Total recharge for Santa Rosa Valley (Reaches 11 and 9B), estimated average, 1973-1983: Boyle Eng. 1987			–0.4	(s)	Part of in-stream flow enters groundwater in Reach 11. Groundwater recharge plus ag. withdrawals consume most flow; little flow leaves Reach 11 under non-storm conditions (assumed to be 1.0 ft3/sec in typical conditions, 2.2 under maximum non-storm flow).

Table A-1B. Sources of Data for Linkage Analysis and Assumptions Used in Mass Balance Model for Typical Conditions, Part 2: Southern Reaches

Reach	Inflows and Outflows to Reach: Best Available Data				Assumption for Model		
Type of Inflow or Outflow	Flow, ft3/s*	Data Source for Flow	Conc., mg/L	Data Source for Concentration	Flow, ft3/s*	Conc., mg/L	Rationale for Assumption
Control point: USGS gauge, Conejo Creek	16	USGS data: non-storm conditions, 1979-1983. Inflow from Reaches 10, 11, 12, 13.			16		Selected flow defines typical conditions. Concentration is not an input at this point.
Conejo Creek main stem, Reach 9B							
Urban non-storm runoff	2.7 (sum, Rchs 11 and 9B)	Total runoff for Santa Rosa Valley (Reach 11 and 9B), estimated average for 1973-1983: Boyle Engineering 1987	20	As above.	0.5	100	Remainder of 2.7 cfs estimated runoff not assumed to originate in Reach 11.
Agricultural withdrawals	-4.2 (sum, Rchs 11 and 9B)	Total irrigation withdrawals for Santa Rosa Valley (Reaches 11 and 9B), estimated average 1973-1983: Boyle Engineering, 1987			–1.0	(s)	Withdrawals are not authorized in Reach 9, but the reach is designated for agricultural use; some pumping for irrigation observed by RWQCB staff.
Groundwater discharge					1.0	150	. Rising groundwater is documented downstream, in Reach 3, especially near Camrosa discharge; similar conditions exist upstream of the confluence, in Reach 9B.
Subsurface inflow	1	Estimate for 1973-1983: Boyle Eng. 1987			1	(s)	Flow from upstream reach into downstream via water table beneath stream - not recorded at Conejo Creek gauge
Conejo Creek main stem, Reach 9A							
Diversion	-11	Does not exist at present—not used in developing model based on present data—but linkage model includes the proposed diversion at this point, near U.S. Route 101 overpass			-11	(s)	Assumed to divert all in-stream water expect the minimum required to satisfy habitat requirements; i.e. 6 ft3/sec will remain in the waterbody downstream of the diversion, all other flow will be removed. Under assumed typical low-flow conditions, the projected quantity diverted is 11.0 ft3/sec.

Table A-1B. Sources of Data for Linkage Analysis and Assumptions Used in Mass Balance Model for Typical Conditions, Part 2: Southern Reaches

Reach	Inflows and Outflows to Reach: Best Available Data				Assumption for Model		
Type of Inflow or Outflow	Flow, ft3/s*	Data Source for Flow	Conc., mg/L	Data Source for Concentration	Flow, ft3/s*	Conc., mg/L	Rationale for Assumption
Groundwater discharge					0.5	150	Rising groundwater is documented downstream, in Reach 3, especially near Camrosa discharge; similar conditions exist upstream of the confluence, in Reach 9A.
Camarillo Wastewater Treatment Plant (POTW)	3.3	Average of 1999 NPDES reported discharges	175	Average of 1999 NPDES reported discharges	3.3	175	

Table A-1C. Sources of Data for Linkage Analysis and Assumptions Used in Mass Balance Model for Typical Conditions, Part 3: Main Stem Calleguas Creek

Reach	Inflows and Outflows to Reach: Best Available Data				Assumption for Model		
Type of Inflow or Outflow	Flow, ft3/s*	Data Source for Flow	Conc., mg/L	Data Source for Concentration	Flow, ft3/s*	Conc., mg/L	Rationale for Assumption
Calleguas Creek main stem, Reach 3							
Groundwater discharge (near Conejo Creek confluence)					1.0	250	Rising groundwater is documented in the vicinity of Camrosa WWRF percolation ponds, and is assumed to be present in similar quantities and similar chloride concentration elsewhere in the reach.
Agricultural withdrawals					–1.0	(s)	Agricultural withdrawal is not permitted in Reach 3, but the reach is designated for irrigation beneficial use and illegal surface pumps have been observed by RWQCB.
Agricultural discharge					1.0	250	Tile drains are known to contribute surface flow in this reach. Under typical low-flow conditions, discharge volume is assumed to be 1.0; during maximum non-storm flow, discharge volume is assumed to be 2.0 ft3/sec. Concentration is assumed equal to measured concentration in rising groundwater in this reach.
Inflow from Reach 6					0	0	Reach 6 does not contribute any flow under standard low-flow conditions; all flow enters groundwater upstream of the confluence with Reach 3.
Inflow from Reach 9					9.8	(s)	Calculated by the model using data and assumptions described in this table, to be consistent with typical conditions at USGS Gauge Potrero Road and projected impacts of Camrosa Diversion.
Camrosa Wastewater Reclamation Facility (POTW)	2.3	Facility is assumed to operate at plant design flow of 1.5 MGD (= 2.3 cfs): Rincon, 1998	250	Average of 1997-98 effluent conditions: Rincon, 1998	0	0	Camrosa WWRF effluent is discharged to percolation ponds, not to stream channel.

Table A-1C. Sources of Data for Linkage Analysis and Assumptions Used in Mass Balance Model for Typical Conditions, Part 3: Main Stem Calleguas Creek

Reach	Inflows and Outflows to Reach: Best Available Data				Assumption for Model		
Type of Inflow or Outflow	Flow, ft3/s*	Data Source for Flow	Conc., mg/L	Data Source for Concentration	Flow, ft3/s*	Conc., mg/L	Rationale for Assumption
Groundwater discharge (near Camrosa WWRF)					2.3	250	Camrosa WWRF effluent is discharged to percolation ponds in an area with a rising groundwater table, so is assumed to rapidly enter stream channel, in the same quantity and with the same chemical characteristics as facility effluent.
Control point: USGS gauge, Calleguas Creek Potrero Road	30	USGS data: non-storm conditions, 1979-1983. Includes inflow from reaches 9, 10, 11, 12, 13; the figure of 30 ft3/sec does not include influence from the projected Camrosa Diversion.			10.8	(s)	Concentration calculated by the model using data and assumptions described in this table. Selected flow defines critical conditions at USGS Gauge Potrero Road, consistent with projected impacts of Camrosa Diversion.

* Flow entering stream (inflow) is indicated by a positive number; outflow is indicated by a negative number
(s) Stream conditions control this concentration: withdrawal water quality is dictated by ambient concentration at this point.